



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.08.2003 Bulletin 2003/32

(51) Int Cl.7: **G01S 7/40, G01S 13/93**

(43) Date of publication A2:
14.08.2002 Bulletin 2002/33

(21) Application number: **02250856.8**

(22) Date of filing: **07.02.2002**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR
 Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: **FUJITSU TEN LIMITED**
 Kobe-shi, Hyogo (JP)

(72) Inventor: **Isaji, Osamu, c/o Fujitsu Ten Limited**
 Kobe-shi, Hyogo (JP)

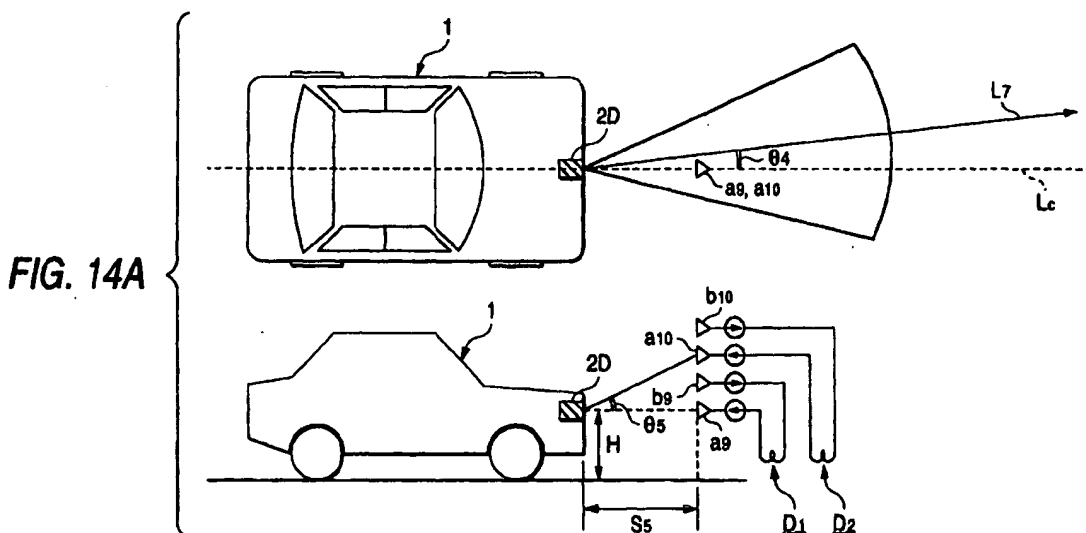
(30) Priority: **08.02.2001 JP 2001032996**
09.02.2001 JP 2001034406
09.02.2001 JP 2001034725

(74) Representative: **Skone James, Robert Edmund**
GILL JENNINGS & EVERY
 Broadgate House
 7 Eldon Street
 London EC2M 7LH (GB)

(54) **Method and device for aligning radar mount direction, and radar aligned by the method or device**

(57) A radar mount direction alignment device to be used for aligning the transmit/receive direction of a radar device 2D mounted on a member on which a radar device is to be mounted, such as a vehicle 1. The radar mount direction alignment device has receiving sections b9, b10 for receiving a signal emitted from the radar device 2D, and transmission sections a9, a10 for transmit-

ting a signal to the radar device 2D. The radar mount direction alignment device has the function of emitting, toward the radar device 2D, a signal which, upon receipt of a signal output from the radar device 2D, behaves as if having been received at and reflected from a position farther from the radar device 2D than a distance between the radar device 2D and the radar mount direction alignment device.



BEST AVAILABLE COPY



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 25 0856

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 164 734 A (FREDERICKS DUANE G ET AL) 17 November 1992 (1992-11-17) * abstract; figures 1,2 * * column 1-9 *	1-11, 42-48	G01S7/40 G01S13/93
X	GB 1 085 071 A (ELLIOTT BROTHERS LONDON LTD) 27 September 1967 (1967-09-27) * the whole document *	1-11, 42-48	
X	US 6 087 995 A (GRACE MARTIN I ET AL) 11 July 2000 (2000-07-11) * abstract; figures 1,3,5 * * column 2, line 13-32; claims 7,8 * * column 5, line 14-24; claims 12,13 *	1-11, 42-48 16-19	
X	WO 99 50686 A (KOENIG AXEL ;LOELKES PETER (DE); OHL THEODOR (DE); HONEYWELL AG (D)) 7 October 1999 (1999-10-07) * abstract; figures 1,2 * * page 2, line 22-29 *	1-8	
X	GB 2 318 010 A (SECR DEFENCE) 8 April 1998 (1998-04-08) * abstract; figure 1 * * page 7, line 31 - page 8, line 6 *	1-8	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G01S
X	GB 691 570 A (VICKERS ELECTRICAL CO LTD) 13 May 1953 (1953-05-13) * page 1, column 13-45; figures 1,2 * * page 3, line 79-91 *	1-8	
A	CH 355 485 A (GEN MILLS INC) 15 July 1961 (1961-07-15) * page 1, line 1-5; figures 1,2 * * page 3, line 20-27 *	1-11, 42-48	
-/--			
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 2 June 2003	Examiner Schmelz, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03 82 (P04001)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 25 0856

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.C1.7)
X	EP 0 905 526 A (THOMSON CSF) 31 March 1999 (1999-03-31)	12,14, 20-24	
A	* paragraphs '0012!-'0017!; figures 2-4 *	13,25,26	
P,X	US 6 329 952 B1 (GRACE MARTIN I) 11 December 2001 (2001-12-11) * abstract; figures 1,2 *	12,20-24	
A	WO 98 38691 A (BOSCH GMBH ROBERT ;BEEZ THOMAS (DE); MAYER HERMANN (DE); ADOLPH DI) 3 September 1998 (1998-09-03) * the whole document *	14,15	
A	DE 197 07 591 C (BOSCH GMBH ROBERT) 29 October 1998 (1998-10-29) * the whole document *	16-19, 27,28	
A	GRACE M ET AL: "76GHZ RADAR ANTENNA ALIGNMENT SYSTEM" 30TH EUROPEAN MICROWAVE CONFERENCE PROCEEDINGS. PARIS, OCT. 3 - 5, 2000, PROCEEDINGS OF THE EUROPEAN MICROWAVE CONFERENCE, LONDON: CMP, GB, vol. 3 OF 3 CONF. 30, 5 October 2000 (2000-10-05), pages 175-178, XP001061004 ISBN: 0-86213-212-6 * figures 2,3 *	14-19, 27,28	
<p>The present search report has been drawn up for all claims</p>			<p>TECHNICAL FIELDS SEARCHED (Int.C1.7)</p>
Place of search		Date of completion of the search	Examiner
MUNICH		2 June 2003	Schmelz, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (PouC01)



European Patent
Office

Application Number

EP 02 25 0856

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
1-28, 42-48
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



European Patent
Office

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 02 25 0856

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-11, 42-47 and 48

Claims 1-11, 42-47(apparatus) and 48 (method) deal with a radar mount direction alignment / adjusting device operating by re-sending signals received from the radar device via one or several transmission lines.

2. Claims: 12-13, and 20-26

Claims 12-13 and 20-26(method) deal with a single or a plurality of radar mount direction alignment device(s) having a relative angle sensor sensing a relative angle with reference to a target.

3. Claims: 14-15 and 27-28

Claims 14-15 and 27-28 (method) deal with a single or a plurality of radar mount direction alignment device(s) working with a signal intensity sensor for receiving a signal reflected from a target.

4. Claims: 16-19

Claims 16-19 (method) deal with a single radar mount direction alignment device comprising a mere accumulation of features of claims 1 ff. and 14 ff. without any interaction.

5. Claims: 29-30

Claims 29-30 (apparatus) deal with a radar device per se.

6. Claims: 31-39

Claims 31-39 (method) deal with a single or a plurality of radar mount direction alignment device(s) whereby a change in the level of a signal emitted from the radar device is detected. The difference to the other claims is that the signal is received directly from the radar device and not reflected from a target.

7. Claim : 40

Claim 40 (apparatus) deals essentially with a frequency converter.



European Patent
Office

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 02 25 0856

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

8. Claim : 41

Claim 41 (apparatus) deals essentially with an instrument for measuring a signal level with an FFT system.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 0856

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-06-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5164734 A	17-11-1992	AU 3054292 A WO 9307509 A1 US 5351054 A	03-05-1993 15-04-1993 27-09-1994
GB 1085071 A	27-09-1967	NONE	
US 6087995 A	11-07-2000	US 6329952 B1 US 6335705 B1	11-12-2001 01-01-2002
WO 9950686 A	07-10-1999	DE 19813631 A1 CA 2325418 A1 DE 29824511 U1 WO 9950686 A1 EP 1064565 A1 US 6400311 B1	07-10-1999 07-10-1999 28-06-2001 07-10-1999 03-01-2001 04-06-2002
GB 2318010 A	08-04-1998	NONE	
GB 691570 A	13-05-1953	NONE	
CH 355485 A	15-07-1961	NONE	
EP 0905526 A	31-03-1999	FR 2769085 A1 EP 0905526 A1	02-04-1999 31-03-1999
US 6329952 B1	11-12-2001	US 6087995 A US 6335705 B1	11-07-2000 01-01-2002
WO 9838691 A	03-09-1998	DE 19707590 A1 WO 9838691 A1 DE 19736307 A1 JP 2001513887 T US 6363619 B1	03-09-1998 03-09-1998 25-02-1999 04-09-2001 02-04-2002
DE 19707591 C	29-10-1998	DE 19707591 C1	29-10-1998

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☒ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.